

IN THE CLAIMS:

This listing of the claims will replace all prior versions, and listings, of the claims in the application.

Claim 1. (currently amended) An isolated nucleic acid fragment comprising a nucleic acid sequence selected from the group consisting of (a) a nucleic acid sequence encoding a plant plastid or microsomal enzyme which catalyzes the formation of a double bond between carbon positions 3 and 4 numbered from the methyl end of a fatty acyl chain wherein said enzyme has an amino acid identity of ~~50%~~ 90% or greater to a polypeptide having an amino acid sequence of any one of SEQ ID NOS:2, 5, 7, 9, 11, 13, 15 or 17 or (b) a nucleic acid sequence, or complement thereof or part thereof which is useful in (i) antisense inhibition or (ii) sense suppression of endogenous desaturase activity in a transformed plant wherein the nucleic acid sequence encodes a polypeptide with an amino acid identity of ~~50%~~ 90% or greater to the polypeptide having the amino acid sequence of any one of SEQ ID NOS:2, 5, 7, 9, 11, 13, 15 or 17.

Claims 2-19. (cancelled)

Claim 20. (previously presented) An isolated nucleic acid fragment comprising a nucleic acid sequence which is useful in antisense inhibition or sense suppression of endogenous desaturase activity in a transformed plant wherein said nucleic acid sequence hybridizes to one of the nucleotide sequences set forth in SEQ ID NOS:1, 3, 4, 6, 8, 10, 12, 14 and 16 or any portion thereof under one of the following sets of conditions:

(a) hybridization in 50 mM Tris, pH 7.6, 6X SSC, 5X Denhardt's, 0.5% sodium dodecyl sulfate (SDS), 100 µg denatured calf thymus DNA at 50°C overnight and wash with 6X SSC, 0.5% SDS at room temperature for 15 min, repeat with 2X SSC, 0.5% SDS at 45°C for 30 min, then repeat twice with 0.2X SSC, 0.5% SDS at 50 °C for 30 min each;

(b) hybridization in 50 mM Tris, pH 7.6, 6X SSC, 5X Denhardt's, 0.5% sodium dodecyl sulfate (SDS), 100 µg denatured calf thymus DNA at 50°C

overnight and wash with 6X SSC, 0.5% SDS at room temperature for 15 min, repeat with 2X SSC, 0.5% SDS at 45°C for 30 min, then repeat twice with 0.2X SSC, 0.5% SDS at 60 °C for 30 min each;

(c) hybridization in 50 mM Tris-HCl, pH 7.5, 1M NaCl, 1% sodium dodecyl sulfate (SDS), 5% dextran sulfate and 0.1 mg/mL denatured salmon sperm DNA at 50°C for eighteen hours and wash twice at room temperature with 2X SSPE, 1% SDS for 5 min, then washing for 5 min at 50 °C in 0.2X SSPE, 1% SDS;

(d) hybridization in 50 mM Tris-HCl, pH 7.5, 1M NaCl, 1% sodium dodecyl sulfate (SDS), 5% dextran sulfate and 0.1 mg/mL denatured salmon sperm DNA at 50°C for sixteen hours and wash twice at room temperature with 2X SSPE, 1% SDS for 5 min, then wash with fresh solution for 10 min, then wash for 5 min at 50 °C in 0.5X SSPE, 1% SDS;

(e) hybridization in 50 mM Tris, pH 7.6, 6X SSC, 5X Denhardt's, 0.5% sodium dodecyl sulfate (SDS), 100 µg denatured calf thymus DNA at 50°C overnight and wash with 6X SSC, 0.5% SDS at room temperature for 15 min, then wash twice with 2X SSC, 0.5% SDS at 45°C for 30 min each and then wash twice with 0.2X SSC, 0.5% SDS at 60 °C for 30 min each; or

(f) hybridization in 50 mM Tris-HCl, pH 7.5, 1M NaCl, 1% sodium dodecyl sulfate (SDS), 5% dextran sulfate and 0.1 mg/mL denatured salmon sperm DNA at 50°C for eighteen hours and wash twice at room temperature with 2X SSPE, 1% SDS for 5 min, followed by washing for 5 min at 50°C in 0.2X SSPE, 1% SDS.

Claim 21. (previously presented) An isolated nucleic acid fragment of Claim 1 or 20 wherein said fragment is isolated from a plant selected from the group consisting of soybean, oilseed *Brassica* species, *Arabidopsis thaliana* and corn.

Claim 22. (previously presented) A chimeric gene capable of causing altered levels of linolenic acid in a transformed plant cell, the gene comprising a nucleic acid fragment of Claim 1 or 20, the fragment operably linked to regulatory sequences.

Claim 23. (previously presented) Plants comprising the chimeric gene of claim 22.

Claim 24. (previously presented) Seeds obtained from the plants of claim 23 wherein said seeds are transformed with the chimeric gene of claim 22.

Claim 25. (withdrawn) Oil obtained from the seeds of claim 24.

Claim 26. (previously presented) A method of producing seed oil containing altered levels of linolenic (18:3) acid comprising:

- (a) transforming a plant cell of an oil-producing species with a chimeric gene of Claim 22;
- (b) growing fertile plants from the transformed plant cells of step (a);
- (c) screening progeny seeds from the fertile plants of step (b) for the desired levels of linolenic (18:3) acid; and
- (d) processing the progeny seed of step (c) to obtain seed oil containing altered levels of linolenic (18:3) acid.

Claim 27. (previously presented) The method of claim 26 wherein said plant cell of an oil-producing species is selected from the group consisting of *Arabidopsis thaliana*, soybean, oilseed *Brassica napus*, sunflower, safflower, cocoa, cotton, peanut, and corn.

Claim 28. (cancelled)

Claim 29. (currently amended) An isolated nucleic acid fragment comprising a nucleic acid sequence selected from the group consisting of (a) a nucleic acid sequence encoding a delta-15 fatty acid desaturase with an amino acid identity of ~~50%~~ 90% or greater to a polypeptide having an amino acid sequence of any one of SEQ ID NOS:2, 5, 7, 9, 11, 13, 15 or 17 or (b) a nucleic acid sequence or complement thereof or part thereof which is useful in (i) antisense inhibition or (ii) sense suppression of endogenous desaturase activity in a transformed plant wherein the nucleic acid sequence encodes a polypeptide with an amino acid identity of ~~50%~~ 90% or greater to the polypeptide having the amino acid sequence of any one of SEQ ID NOS:2, 5, 7, 9, 11, 13, 15 or 17.

Claim 30. (previously presented) An isolated nucleic acid fragment of claim 29 wherein said plant cell of an oil-producing species is selected from the group consisting of *Arabidopsis thaliana*, soybean, oilseed *Brassica napus*, sunflower, safflower, cocoa, cotton, peanut, and corn.

Claim 31. (previously presented) A chimeric gene capable of causing altered levels of linolenic acid in a transformed plant cell, the gene comprising a nucleic acid fragment of claim 29, the fragment operably linked to regulatory sequences.

Claim 32. (previously presented) Plants comprising the chimeric gene of claim 31.

Claim 33. (previously amended) Seeds obtained from the plants of claim 32 wherein said seeds are transformed with the chimeric gene of claim 31.